



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/646,073  | 08/22/2003  | David R. Shafer      | KLAC0076            | 8450             |
| 36438 7590 01/13/2011<br>SMYRSKI LAW GROUP, A PROFESSIONAL CORPORATION<br>3310 AIRPORT AVENUE, SW<br>SANTA MONICA, CA 90405 |             |                      |                     |                  |
| EXAMINER<br>PRITCHETT, JOSHUA L   |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 2872  |             |                      |                     |                  |
| MAIL DATE   |             | DELIVERY MODE        |                     |                  |
| 01/13/2011  |             | PAPER                |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/646,073

**Applicant(s)**

SHAHER ET AL.

**Examiner**

/JOSHUA L. PRITCHETT/

**Art Unit**

2872

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 43-99 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 43-99 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-940)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/10
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This action is in response to Request for Continued Examination and Amendment filed November 23, 2010. Applicant amended claims 43, 55, 65, 78 and 90.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 43-51, 53-74, 76-86 and 88-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer (US 2002/0085271) in view of Shafer (US 6,842,298) and Yonekubo (US 4,108,794).

Regarding claims 43, 46, 50-51, 53-55, 57, 59, 63, 65, 69, 73, 74, 76-78, 81, 85-86, 88-90, 92, 94 and 98, Shafer '271 teaches an objective comprising: at least one focusing lens (11) receiving said light energy and transmitting focused light energy (Fig. 1); at least one field lens (15) receiving said focused light energy and transmitting intermediate light energy (Fig. 1); and at least one Mangin mirror element (17) comprising at least one Mangin mirror element having a flat surface (45) receiving said intermediate light energy and providing controlled light energy to a specimen (Fig. 1) and Mangin mirror group positioned between the field lens group and the

specimen (Fig. 1); wherein the flat surface of at least one Mangin mirror element is proximate the immersion substance (Fig. 1), wherein each focusing lens and each field lens is formed from a single glass material (para. 0021; each lens is made of only a single material) wherein every component of the Mangin mirror group, the field lens group and the focusing lens group is aligned along a received light axis (Fig. 1) and further wherein the Mangin mirror element, the at least one focusing lens, and the at least one field lens are configured to balance aberrations therebetween (para. 0019), the aberration balancing reducing decenter sensitivity of the Mangin mirror element, the at least one focusing lens and the at least one field lens (MPEP 2114), wherein the objective is optimized to produce minimum spherical aberration, axial color, and chromatic variation of aberrations (para. 0010); wherein the at least one Mangin mirror element is optimized to produce spherical, axial color, and chromatic variation of aberrations to compensate for aberrations induced by the focusing lens group (para. 0010); and wherein said at least one Mangin mirror element (17) comprises a single lens/mirror element comprising substantially curved concave surface (41); and a second minimally curved surface (periphery 39). Shafer '271 lacks reference to the claimed diameter. Shafer '298 teaches the claimed diameters (Fig. 6). Shafer '271 lacks the controlled light energy going through an immersion substance to the specimen and wherein both surfaces of the single lens/mirror element are reflective with small central apertures through which light energy may pass. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Shafer '271 invention include the diameters of Shafer '298 for the purpose of using a known arrangement to achieve known and predictable results. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer '271 as taught by Yonekubo to provide better imaging performance because of reduced reflections due to the index matching provided by the immersion substance.

Regarding claims 44-45, 56, 66-68, 64, 79-80, 91 and 99, Shafer '271 in view of Shafer '298 and Yonekubo as set forth above disclose the claimed invention except for wherein said objective has a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the objective have a field size of approximately 0.15 mm and a numerical aperture of approximately 1.2 for the purpose of providing a larger field of view. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 47-48, 58, 60, 70, 71, 82, 83, 93 and 95, Shafer '271 in view of Shafer '298 and Yonekubo as set forth above further disclose said objective having a long working distance used with a microscope (Shafer '271, para. 0028) having a flange (86) but is silent as to the location of the flange being approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the flange be approximately 45 millimeters from the specimen during normal

operation or at least approximately 100 millimeters from the specimen during normal operation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the flange be approximately 45 millimeters from the specimen during normal operation or at least approximately 100 millimeters from the specimen during normal operation for the purpose of having an appropriate working area for interacting with/changing the specimen. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 49, 61-62, 72, 84 and 96-97, Shafer '271 teaches only two glass materials are used (abstract) comprising fused silica and calcium fluoride (para. 0021). Shafer '271 lacks the controlled light energy going through an immersion substance to the specimen and said Mangin mirror element receiving said intermediate light energy through a back/rear side thereof. Immersion substances, including water and oil are well known in the microscope/lithography art to obtain better imaging performance. Yonekubo teaches using an immersion substance, including water and oil, to obtain better imaging performance (columns 1-2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known immersion substance with the objective of Shafer '271 as taught by Yonekubo to provide better imaging performance.

Claims 52, 75 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer '271 et al. in view of Shafer '298 and Yonekubo as applied to claims 43, 66 and 78 above and further in view Deutsch et al., WO 01/57563 A2.

Shafer '271 in view of Shafer '298 and Yonekubo as applied to claims 43 and 78 above disclose the claimed invention except for the immersion substance being a silicone gel. Deutsch teaches using a silicone gel as an immersion substance (page 2, lines 18-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the immersion substance of Shafer '271 in combination with Yonekubo and Shafer '298 be a silicone gel as suggested by Deutsch et al. to provide more controllable flow characteristics to the immersion substance.

### **Response to Arguments**

Applicant's arguments, see Amendment, filed November 23, 2010, with respect to the rejection(s) of claim(s) 43, 55, 65, 78 and 90 under Shafer '298 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shafer '271. Applicant amended the claim language to overcome Shafer '298. Shafer '271 was added to teach the newly claimed limitations. Applicant further argued it would not be clear to one of ordinary skill in the art where to place the immersion substance in the proposed combination. One of ordinary skill in the art knows the immersion substance is most commonly located between the last optical element of the objective and the specimen to be examined. In the combination set forth above the immersion substance would be placed between surface (45) and the specimen. Applicant continues to argue one of ordinary skill would not combine the immersion substance of

Yonekubo with the objective assembly of Shafer '298. The BPAI found the combination to be obvious to one of ordinary skill in the art in the decision mailed February 23, 2010

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /JOSHUA L. PRITCHETT/ whose telephone number is (571)272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSHUA L PRITCHETT/  
Primary Examiner  
Art Unit 2872